ABSTRACT

A bidirectional direct sequence spread spectrum half-duplex RF modem. The RF modem can be applied to transmit and receive numerous types of analog and digital pulse modulation. The modem incorporates a SAW based correlator for performing the spreading and de-spreading functions in the transmitter and receiver. A SAW resonator fabricated on the same monolithic substrate provides the frequency source for the oscillator. An upconverter/downconverter provides frequency translation to the desired frequency band. Pulse gating and interrogating pulse shaping are employed to reduce the spectral side bands of the transmitted spread pulse. The RF modem operates as a analog or digital pulse transmitter and receiver. It is adapted to be generic and is versatile enough to be used in many different types of data communication systems, such as OOK, PWM and PPM. The RF modem can be used as the physical (PHY) layer in a layered communication system such as the ISO OSI communication stack. In an alternative embodiment, the transmission bit rate is increased by using a plurality of correlators wherein each is configured with a unique function (i.e., code) that is orthogonal with all other functions.